

# STTH60L06C

## TURBO 2 ULTRAFAST HIGH VOLTAGE RECTIFIER

**Table 1: Main Product Characteristics** 

I <sub>F(AV)</sub>	Up to 2 x 40 A
V <sub>RRM</sub>	600 V
T <sub>j</sub>	175°C
V <sub>F</sub> (typ)	1.0 V
t <sub>rr</sub> (max)	65 ns

## **FEATURES AND BENEFITS**

- Ultrafast switching
- Low reverse current
- Low thermal resistance
- Reduces switching & conduction losses

# TO-247 STTH60L06CW

## **DESCRIPTION**

The STTH60L06, which is using ST Turbo 2 600V technology, is specially suited for use in switching power supplies, and industrial applications, as rectification and discontinuous mode PFC boost diode.

**Table 2: Order Codes** 

Part Number	Marking
STTH60L06CW	STTH60L06CW

Table 3: Absolute Ratings (limiting values, per diode)

Symbol	Parameter	Value	Unit		
V <sub>RRM</sub>	Repetitive peak reverse voltage		600	V	
I <sub>F(RMS)</sub>	RMS forward voltage			60	Α
I <sub>F(AV)</sub>	Average forward current $\delta = 0.5$	Tc = 125°C Per diode Tc = 110°C Per device		30 60	Α
		Tc = 100°C Tc = 80°C	Per diode Per device	40 80	
I <sub>FSM</sub>	Surge non repetitive forward current	tp = 10ms si	nusoidal	210	Α
T <sub>stg</sub>	Storage temperature range	-65 to + 175	°C		
T <sub>j</sub>	Maximum operating junction temperature	175	°C		

**Table 4: Thermal Resistance** 

Symbol	Parameter	Value (max).	Unit	
R <sub>th(j-c)</sub>	Junction to case	Per diode	1.05	°C/W
		Total	0.68	
R <sub>th(c)</sub>	Coupling		0.3	°C/W

Table 5: Static Electrical Characteristics (per diode)

Symbol	Parameter	Test conditions		Min.	Тур	Max.	Unit
I <sub>R</sub> *	Reverse leakage current	T <sub>j</sub> = 25°C	$V_R = V_{RRM}$			25	μΑ
		T <sub>j</sub> = 150°C			80	800	
V <sub>F</sub> **	Forward voltage drop	T <sub>j</sub> = 25°C	I <sub>F</sub> = 30A			1.55	V
		T <sub>j</sub> = 150°C			1.0	1.25	
		T <sub>j</sub> = 25°C	I <sub>F</sub> =60A			1.78	
		T <sub>j</sub> = 150°C			1.24	1.55	

Pulse test:

To evaluate the conduction losses use the following equation:  $P = 0.95 \times I_{F(AV)} + 0.010 I_{F}^{2}(RMS)$ 

**Table 6: Dynamic Characteristics** (per diode)

Symbol	Parameter		Test conditions	Min.	Тур	Max.	Unit
t <sub>rr</sub>	Reverse recovery	T <sub>j</sub> = 25°C	$I_F = 0.5A$ $Irr = 0.25A$ $I_R = 1A$			65	ns
	time		$I_F = 1A dI_F/dt = 50 A/\mu s V_R = 30V$		65	90	
I <sub>RM</sub>	Reverse recovery current		$I_F = 30A$ $V_R = 400V$ $dI_F/dt = 100 A/\mu s$		11.5	16	Α
t <sub>fr</sub>	Forward recovery time	T <sub>j</sub> = 25°C	$I_F = 30A$ $dI_F/dt = 100 A/\mu s$ $V_{FR} = 1.1 \times V_{Fmax}$			500	ns
V <sub>FP</sub>	Forward recovery voltage	T <sub>j</sub> = 25°C	$I_F = 30A$ $dI_F/dt = 100 A/\mu s$ $V_{FR} = 1.1 \times V_{Fmax}$		2.5		V

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When the diodes 1 and 2 are used simultaneously:  $\Delta \text{ Tj(diode 1)} = \text{P(diode 1)} \times \text{R}_{th(j-c)}(\text{Per diode}) + \text{P(diode 2)} \times \text{R}_{th(c)}$ 

<sup>\*</sup> tp = 5 ms,  $\delta$  < 2%

<sup>\*\*</sup> tp = 380 µs,  $\delta$  < 2%

Figure 1: Conduction losses versus average forward current (per diode)

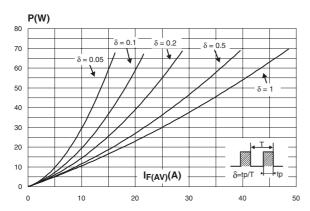


Figure 3: Relative variation of thermal impedance junction to case versus pulse duration

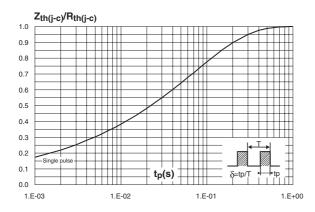


Figure 5: Reverse recovery time versus dI<sub>F</sub>/dt (typical values, per diode)

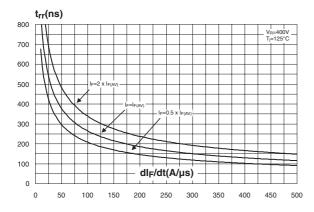


Figure 2: Forward voltage drop versus forward current (per diode)

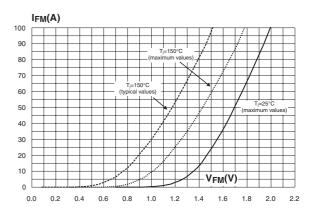


Figure 4: Peak reverse recovery current versus dl<sub>F</sub>/dt (typical values, per diode)

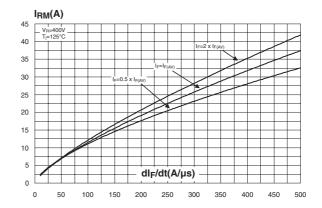


Figure 6: Reverse recovery charges versus dl<sub>F</sub>/dt (typical values, per diode)

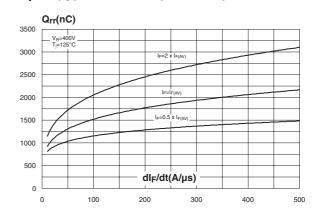


Figure 7: Reverse recovery softness factor versus dl<sub>F</sub>/dt (typical values, per diode)

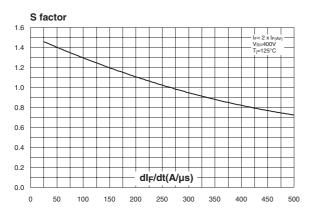


Figure 9: Transient peak forward voltage versus dl<sub>F</sub>/dt (typical values, per diode)

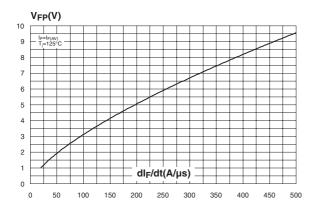


Figure 11: Junction capacitance versus reverse voltage applied (typical values, per diode)

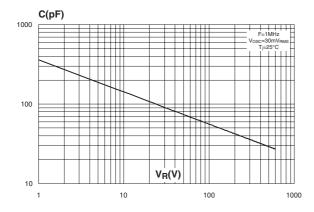


Figure 8: Relative variations of dynamic parameters versus junction temperature

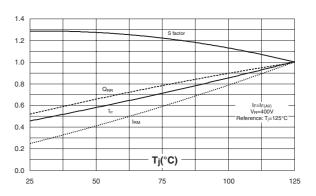
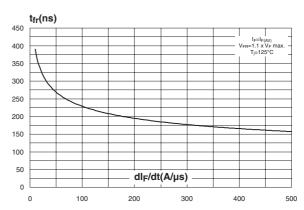
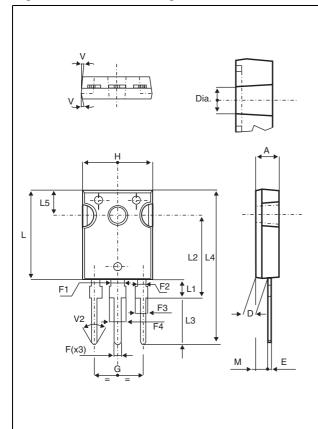


Figure 10: Forward recovery time versus dl<sub>F</sub>/dt (typical values, per diode)



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Figure 12: TO-247 Package Mechanical Data



			DIMEN	SIONS	3	
REF.	Mi	llimete	ers		Inches	i
	Min.	Тур.	Max.	Min.	Тур.	Max.
Α	4.85		5.15	0.191		0.203
D	2.20		2.60	0.086		0.102
Е	0.40		0.80	0.015		0.031
F	1.00		1.40	0.039		0.055
F1		3.00			0.118	
F2		2.00			0.078	
F3	2.00		2.40	0.078		0.094
F4	3.00		3.40	0.118		0.133
G		10.90			0.429	
Н	15.45		15.75	0.608		0.620
L	19.85		20.15	0.781		0.793
L1	3.70		4.30	0.145		0.169
L2		18.50			0.728	
L3	14.20		14.80	0.559		0.582
L4		34.60			1.362	
L5		5.50			0.216	
М	2.00		3.00	0.078		0.118
V		5°			5°	
V2		60°			60°	
Dia.	3.55		3.65	0.139		0.143

**Table 7: Ordering Information** 

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STTH60L06CW	STTH60L06CW	TO-247	4.46 g	50	Tube

■ Epoxy meets UL94, V0

■ Cooling method: by conduction (C)

■ Recommended torque value: 0.8 m.N.

Maximum torque value: 1.0 m.N.

**Table 8: Revision History** 

Date	Revision	Description of Changes
07-Sep-2004	1	First issue

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